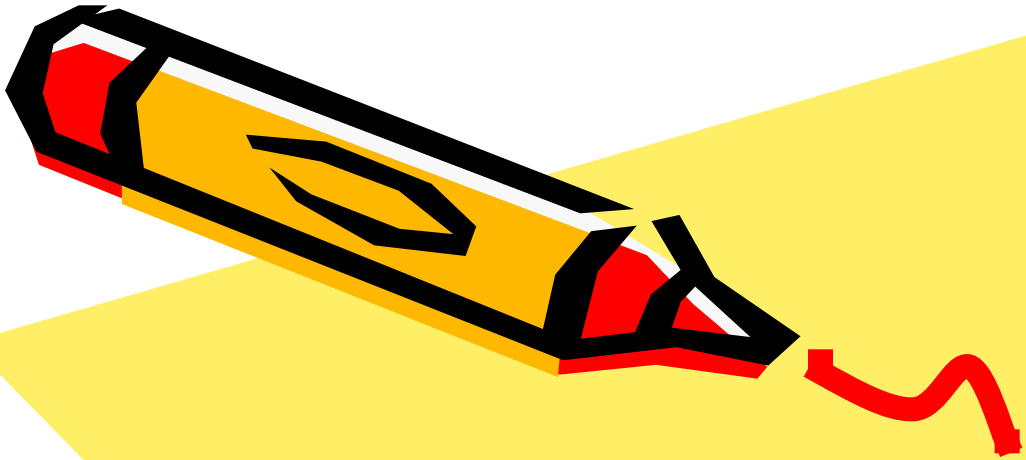

Common Pediatric Infections

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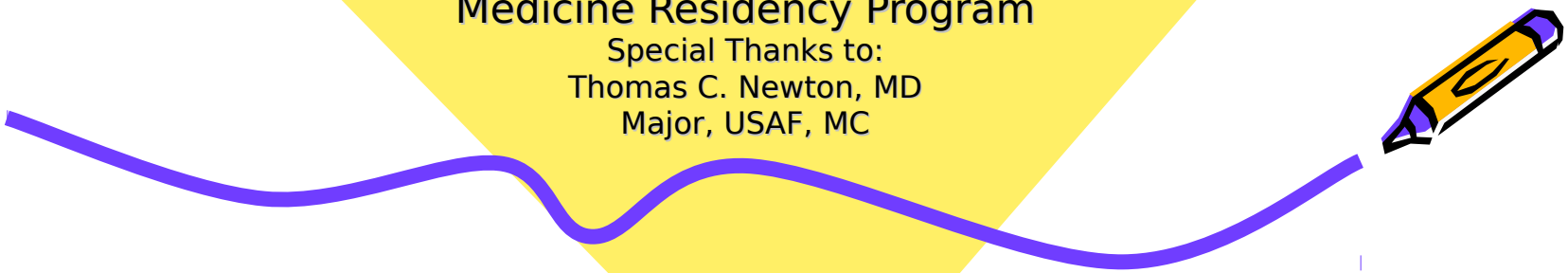
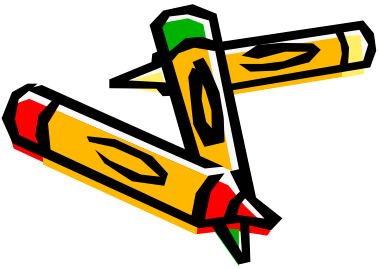
Special Thanks to:
Thomas C. Newton, MD
Major, USAF, MC



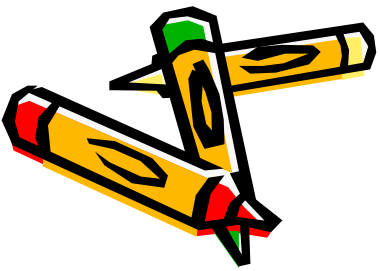
Learning Objectives

- Acute Otitis Media
  - Accurately diagnose and treat otitis media according to 2004 AAP/AAFP Guidelines
- Acute Bacterial Sinusitis
  - Accurately diagnose and treat bacterial sinusitis according to 2001 AAP guidelines

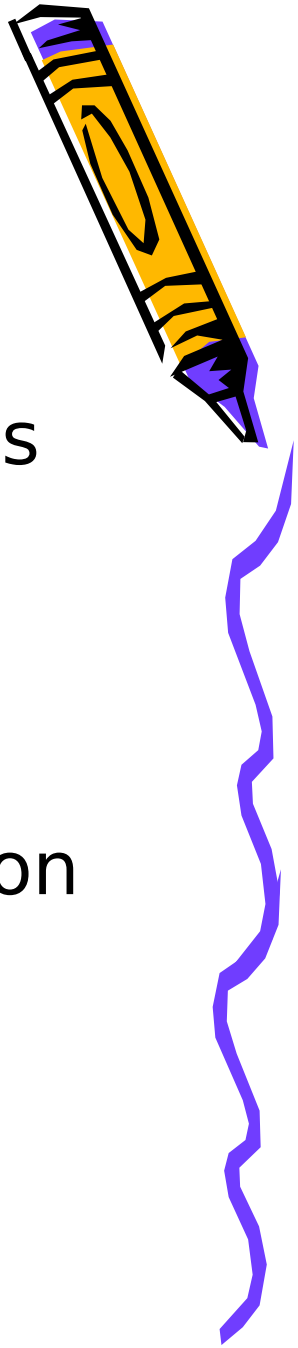


Acute Otitis Media

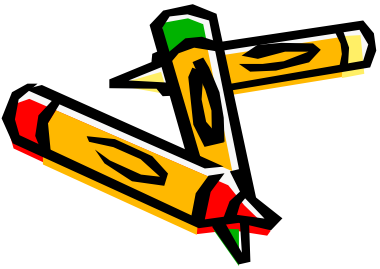
- Most common bacterial illness in children
- 25 million office visits and 20 million prescriptions in 1990
- Visits decreased to 16 million in 2000 with the same prescribing rate



Diagnosis of Acute Otitis Media (AOM)

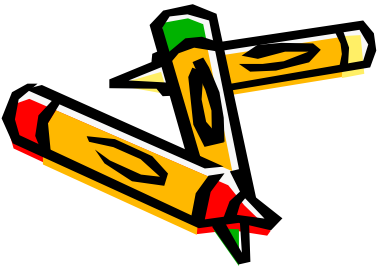


- Recent, usually abrupt onset of illness
- Signs/symptoms of middle ear inflammation
  - Otalgia (ear tugging in infant), irritability/crying, otorrhea, and/or fever
- Presence of middle ear fluid or effusion
  - Bulging tympanic membrane (highest predictive value) , limited or absent mobility, air fluid level, or otorrhea



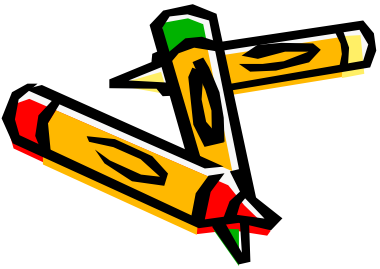
Management of AOM

- If pain is present the clinician should recommend treatment to reduce pain
  - Acetominophen and ibuprofen
  - Benzocaine/Ametocaine/Phenazone topical agents
  - Narcotic analgesia with codeine
    - for selected severe pain
    - must way potential side effect profile



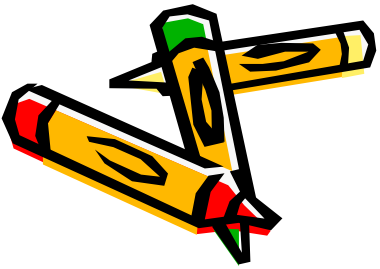
Treatment of AOM

- Observation without use of antibacteral agents is an option for selected children based on:
  - presence of uncomplicated AOM
  - diagnostic certainty
  - age
  - illness severity
  - assurance of follow-up



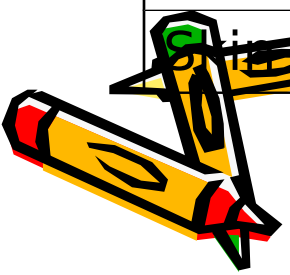
Criteria for Initial Antibiotic Treatment vs Observation in children with AOM

AGE	Certain Diagnosis	Uncertain Diagnosis
< 6 months	Antibacterial therapy	Antibacterial therapy
6 months to 2 years	Antibacterial therapy	Antibacterial therapy if severe illness; observation option if non-severe illness
2 to 12 years	Antibacterial therapy if severe illness; observation option if non-severe illness	Observation option



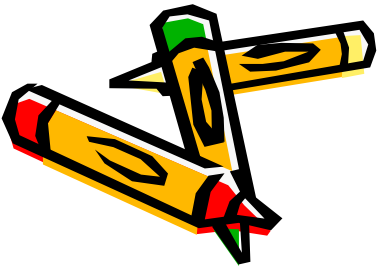
Comparative AOM Outcomes for Observation versus Antibacterial Agent

AOM Outcome	Antibacteral Rx	Observation
Relief at 24 hours	60%	59%
Relief at 2-3 days	91%	87%
Relief at 4-7 days	79%	71%
Clinical Resolution	82%	72%
Mastoiditis/Complication	0.59%	0.17%
Persistent MEE 4-6 wks	45%	48%
Persistent MEE 3 mo.	21%	26%
Diarrhea/Vomiting	16%	-
Skin Rash/Allergy	2%	-



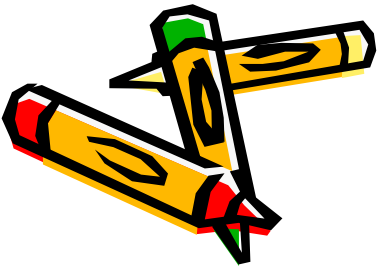
Common Pathogens in AOM

- *Streptococcus pneumoniae*: 25-50%
  - Decrease from 49 to 34% with use of heptavalent pneumococcal vaccine (prevnar)
- *Haemophilis influenza*: 15-30%
- *Moraxella catarrhalis* 3-20%
- Viral etiologies 40-75%
  - RSV, rhinovirus, coronavirus, parainfluenza, adenovirus, and enterovirus



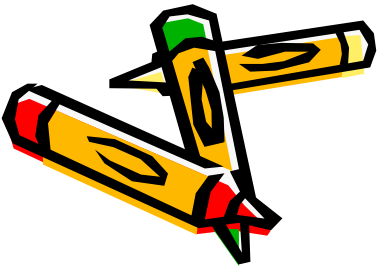
Initial Antibacterial Agent Choice

- **Amoxicillin** 80-90mg/kg/day for 7 to 10 days
  - Higher dose to combat alterations in penicillin binding protein in *S. Pneumoniae*
- Alternates for Penicillin Allergy
  - Cefdinir, cefpodoxime, cefuroxime, azithromycin, or clarithromycin



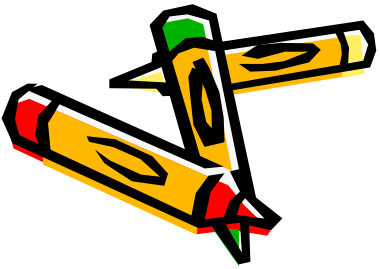
Second Line Antibacterial Agent Choices

- Amoxicillin-clavulante 90mg/kg/day of the amoxicillin component for 7 to 10 days
  - First line for those with severe illness (moderate to severe otalgia or fever >39C)
- Ceftriaxone 50mg/kg dose parenterally for 1-3 consecutive days



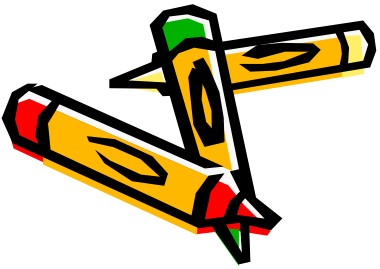
Reduction of Risk Factors

- Breastfeeding for at least the first 6 months
- Avoiding supine bottle-feeding (bottle propping)
- Elimination of pacifier use in the second 6 months of life
- Elimination of exposure to passive tobacco smoke



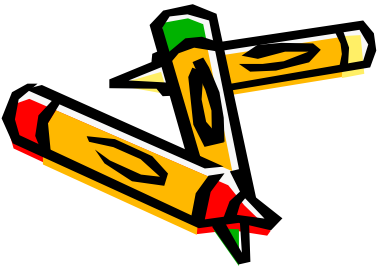
Acute Bacterial Sinusitis (ABS)

- Sinusitis
  - inflammation of the paranasal sinuses
  - can be viral, allergic, or bacterial in origin
- Acute Bacterial Sinusitis
  - bacterial infection of the paranasal sinuses that has been present at least 10 days and in most cases less than 30.
- Chronic Sinusitis
  - symptoms of at least 12 weeks duration.



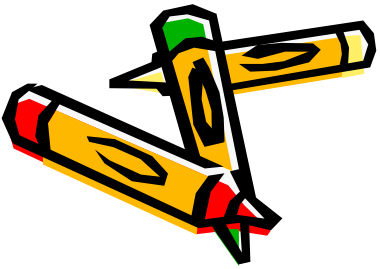
ABS Epidemiology

- Upper respiratory tract symptoms (nasal congestion, rhinorrhea, and cough) are the most common complaint in the pediatric office
- Young children experience 6-8 episodes of viral URIs yearly and 5-10% are complicated by ABS
- Can be challenging to distinguish between viral URIs, allergic rhinitis, and ABS



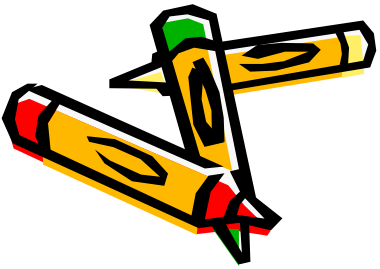
Sinus Development

- Maxillary Sinuses – present at birth
- Ethmoid Sinuses – present at birth
- Frontal Sinuses – develop by the 5th or 6th birthday
- Sphenoid Sinus– develop by the 5th or 6th birthday



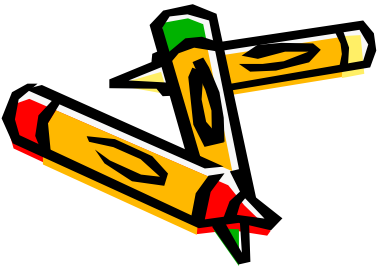
Symptoms and Signs of ABS

- Two Common Clinical Presentations
  - “Persistent”
    - respiratory symptoms (>10 days) and:
    - nasal discharge of any quality (thin or thick; clear, mucoid, or purulent)
    - or a cough present in the daytime, often worse at night
  - “Severe”
    - high fever >39C and
    - purulent nasal discharge
    - Symptoms concurrent for at least 3-4 days



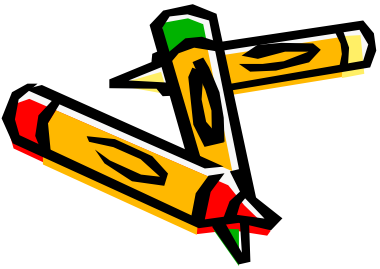
Diagnostic Testing

- Use of radiographic imaging (plain film or CT) is controversial
  - Recent national guideline emphasize the role of clinical diagnosis
- Plain films are appropriate in older children with recurrent ABS, vague symptoms, or a poor response to therapy
- CT should be considered for patients with complicated ABS or surgical candidates



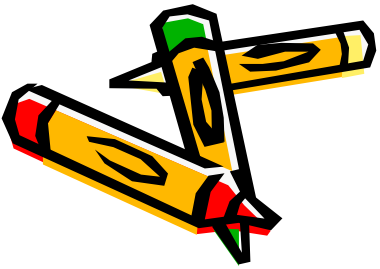
Microbiology of Sinusitis

- *Streptococcus pneumoniae* – 30-40%
- *Haemophilus influenzae* – 20%
- *Moraxella catarrhalis* – 20%
- Viruses – 10%
  - Adenovirus, parainfluenza, influenza, and rhinovirus
- Neither Staphylococci nor respiratory anaerobes are common in ABS



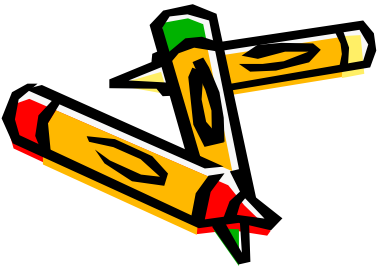
Medical Treatment

- First Line:
  - Amoxicillin 80-90 mg/kg/day for 10-14 days
  - Longer treatments may be considered in chronic sinusitis or to avoid surgery
- Alternatives
  - Amoxicillin-clavulanate, cefuroxime axetil, cefpodoxime, macrolides
  - Consider an alternative if amoxicillin allergy, recent treatment with amoxicillin, or failure of clinical improvement on amoxicillin within 72 hours



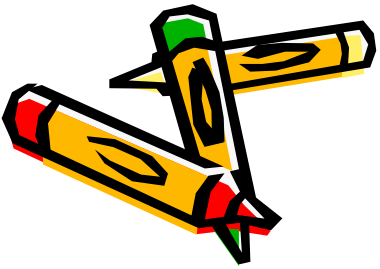
Adjuvant Therapies

- Antihistamines, decongestants, anti-inflammatories
  - Little data for use
  - Potential risks may outweigh benefits
- Topical intranasal steriods
  - Rapid onset prompts consideration for management of acute symptoms, very modest beneficial effects does not generally justify their use
- Nasal irrigation with saline
  - positive effect in some patients



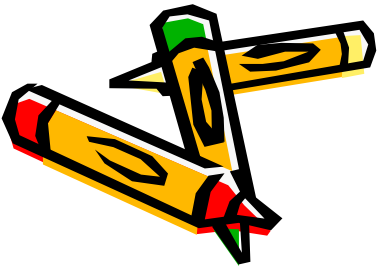
Complications and Surgical Considerations

- Rare
- Contiguous spread of infection to the orbit, bone or central nervous system
- May require surgical intervention
  - Patients with chronic or recurrent ABS who fail to improve with maximal medical therapy, may consider sinus surgery



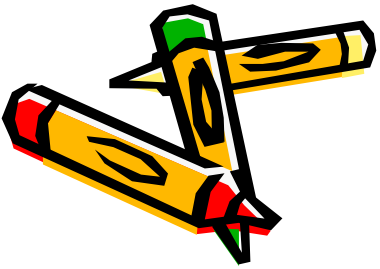
Summary

- Acute otitis media and acute bacterial sinusitis are the 2 most common bacterial infections treated in the pediatric outpatient arena
- Clinical history and examination are the hallmark to proper diagnosis and these conditions rarely require additional diagnostic testing

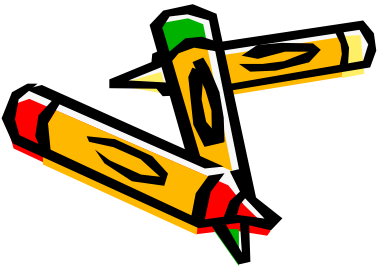


Review Questions

- The 2 bacterial pathogens that play the largest role in acute otitis media are:
  - A) *Haemophilis influenzae*
  - B) *Streptococcus pneumoniae*
  - C) *Moraxella Catarrhalis*
  - D) *Staphylococcus aureus*

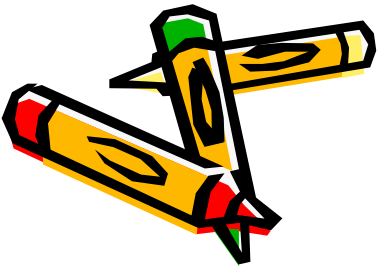


A) H. influenzae &
B) *Streptococcus pneumoniae*

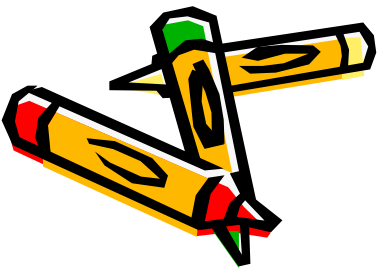


Review Questions

- You see a healthy 5-year-old girl with no significant past medical history in your office for ear pain that started last night. She has no fever and is otherwise well. You diagnose acute otitis media. Your best initial management is:
  - A) Treatment with amoxicillin 40-50mg/kg per day
  - B) Treatment with amoxicillin 80-90mg/kg per day
  - C) Myringotomy and treatment only if cultures are positive for a bacterial etiology
  - D) Treatment with acetominophen for pain and follow-up in 2 to 3 days if no change in symptoms or is symptoms worsen

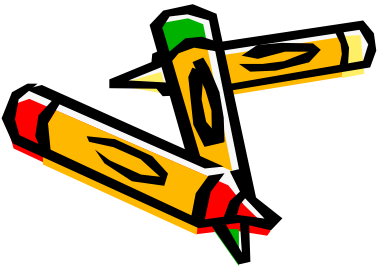


D) Treatment with acetominophen for pain and follow-up in 2 to 3 days if no change in symptoms or is symptoms worsen

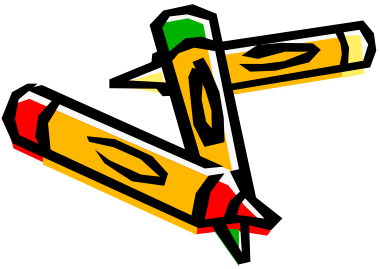


Review Questions

- You are seeing a 15-month-old boy in your office for ear tugging, excessive crying, and fever of 39.5C. He is otherwise healthy though last month he received amoxicillin for treatment of AOM. Today you diagnosis AOM. Best management at this time includes:
  - A) amoxicillin 80-90 mg/kg per day
  - B) cefuroxime axetil
  - C) ceftriaxone parenterally 50mg/kg per day
  - D) amoxicillin-clavulaunate 80-90 mg/kg per day of the amoxicillin component
  - E) treatment with acetominophen and follow-up in 2 to 3 days

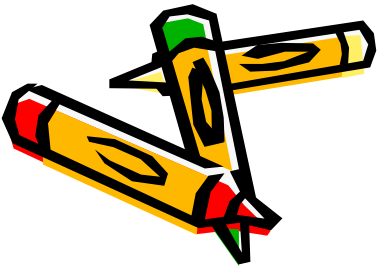


D) amoxicillin-clavulaunate 80-90 mg/kg per day of the amoxicillin component

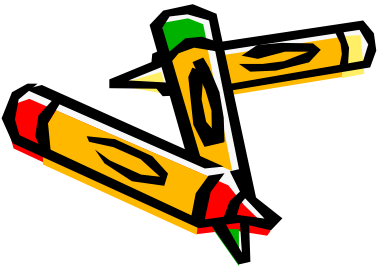


Review Questions

- In considering empiric therapy for a 7-year-old boy in whom you suspect acute sinusitis, you should prescribe:
  - A) amoxicillin 80-90 mg/kg per day
  - B) cefotaxime 300mg/kg per day
  - C) Cefuroxime axetil
  - D) Erythromycin succinate
  - E) Sulfamethoxazole - trimethoprim

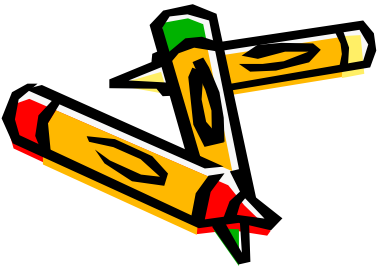


A) amoxicillin 80-90 mg/kg per day

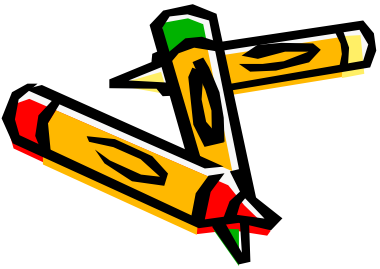


Review Questions

- Acute bacterial sinusitis is best distinguished from a viral upper respiratory tract infection by:
  - A) cough
  - B) duration of symptoms for greater than 10 days
  - C) facial pain and headache
  - D) presence of fever for 1 to 2 days
  - E) purulent nasal discharge

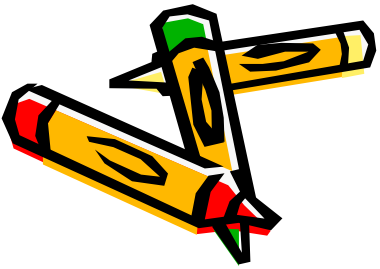


B) duration of symptoms for greater than 10 days

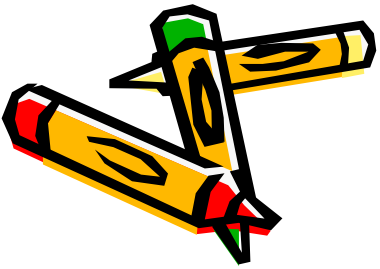


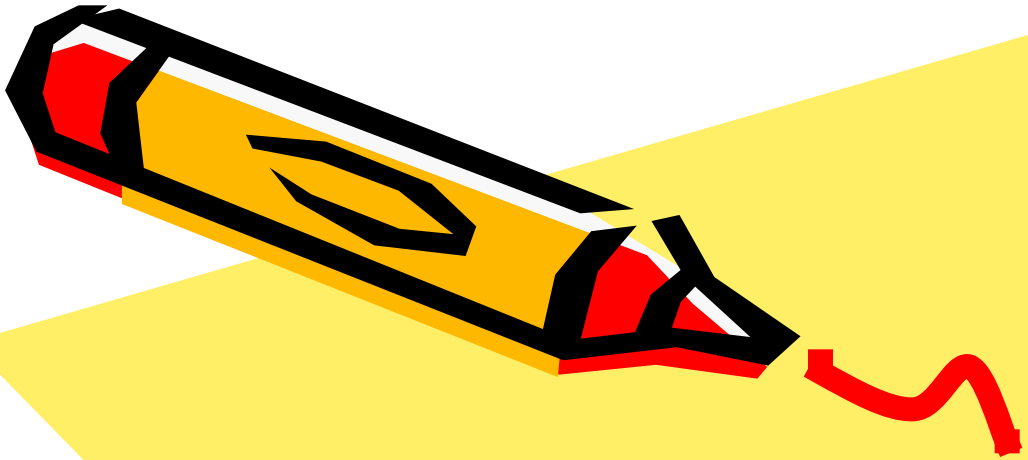
Review Questions

- A diagnosis of acute bacterial sinusitis should be based on:
  - A) a precise clinical history regarding quality and duration of symptoms
  - B) bacterial culture from the nasopharynx
  - C) CT of the paranasal sinuses
  - D) physical examination of the nose and pharynx
  - E) plain film radiographs of the paranasal sinuses



A) a precise clinical history regarding quality and duration of symptoms





Questions???